DOCUMENT RESUME

ED 368 510 PS 022 349

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TITLE Where Do Head Start Attendees End Up? One Reason Why Preschool Effects Fade Out.
PUB DATE 24 Jan 94
NOTE 40p.; Support for this study was received from the American Educational Research Association 1992-93 Grants Program.
PUB TYPE Reports - Research/Technical (143)

EDRS PRICE MF01/PC02 Plus Postage.
DESCRIPTORS Academic Achievement; *Early Experience; *Educational Quality; Followup Studies; Grade 8; Junior High Schools; *Junior High School Students; *Outcomes of Education; *Preschool Education
IDENTIFIERS *Long Term Effects; *Project Head Start

ABSTRACT

A study investigated the relationship between the quality of schools subsequently attended by adolescents and their preschool experience. In particular, the study differentiated the characteristics of middle-grade schools attended by 8th grade students who had experienced either Head Start, other preshools, or no preschool. School quality was defined broadly, in terms of social composition, academic rigor, safety, and social relations. After taking into account family background and demographics, the study found that former Head Start attendees are being educated in schools of significantly lower quality than are their 8th-grade counterparts who did not attend preschool, and particularly compared to peers who attended other preschools. No matter how beneficial the Head Start experience was initially for its participants, such benefits are likely to be undermined if these students are thereafter exposed to lower quality schooling. The particularly low quality of middle-grade schools attended by former Head Start participants explains, at least in part, why Head Start effects often fade out over time. (Author)

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Where Do Head Start Attendees End Up?

One Reason Why Preschool Effects Fade Out

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January 24, 1994

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We wish to acknowledge the generous support for this study from the American Educational Research Association 1992-93 Grants Program, and to Richard Shavelson, Grants Program Committee Chair. We appreciate the assistance of Julia B. Smith and Fong-ruey Liaw for data management in the early phase of this study, and of Robert G. Croninger for helpful comments on an earlier draft. Address all correspondence to: Professor Valerie E. Lee, School of Education, University of Michigan, Ann Arbor, Michigan 48109.

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Abstract

This study investigates the relationship between the quality of schools subsequently attended by young adolescents and their preschool experience. In particular, the study differentiates the characteristics of middle-grade schools attended by 8th grade students who earlier experienced Head Start, other preschools, or did not attend preschool. School quality is defined broadly, in terms of social composition, academic rigor, safety, and social relations. After taking into account family background and demographics, the study concludes that former Head Start attendees are being educated in schools of significantly lower quality than their 8th-grade counterparts who did not attend preschool, and particularly compared to peers who attended other preschools. No matter how beneficial the Head Start experience was initially for its young participants, such benefits are likely to be structurally undermined if these students are thereafter exposed to schooling of systematically lower quality. The particularly low quality of middle-grade schools attended by former Head Start participants explains, at least in part, why Head Start effects often fade out over time.

Where Do Head Start Attendees End Up?
One Reason Why Preschool Effects Fade Out

Background

The social policy agenda is again focussing attention on Project Head Start, as federal funding for, and access to, this program which provides preschool education for socially disadvantaged children is being increased. Although its early and inflated claims of "breaking the cycle of poverty," "innoculating children against poverty," or enabling poor children to "start school on an equal footing with their more privileged peers" have become more realistic over time (Schorr, 1989; Woodhead, 1988; Zigler, 1987; Zigler & Valentine, 1979), public support for Head Start has remained constant. The program is generally perceived to be one of the few enduring successes of the Johnson administration's "war on poverty" (Conger, 1988; Glazer, 1988). The title of Zigler and Muenchow's recent book (1992) describes Head Start as "America's most successful educational experiment."

Effects of Head Start

Fading effects. Several strong studies have demonstrated that Head Start has short-term cognitive, affective, and social benefits for poor children (e.g., Lee, Brooks-Gunn, & Schnur, 1988; McKey et al., 1985). Other preschool programs for disadvantaged children have shown similar benefits (e.g., Lazar & Darlington, 1982; Schweinhart & Weikert, 1986). However, as Head Start graduates move into elementary school, these effects -- especially those in the cognitive domain -- generally decline (Copple et al., 1987; Lazar & Darlington, 1982; Lee, Brooks-Gunn, Schnur, & Liaw, 1990; Miller & Bizzel, 1983, 1984). Decline is particularly rapid for former Head Start children who are not involved in some sort of follow-up intervention (McKey et al., 1985). Most studies have found that at the end of the early elementary grades (i.e., by third or fourth grade), whatever cognitive and affective advantages gained by poor children's participation in Head Start have either vanished completely or faded substantially.[1]

Why do Head Start effects fade over time, and eventually disappear? Several common explanations have been posited: variation in program quality across sites, lack of follow-through compensatory education, and subsequent

weaknesses in the educational environments to which poor students are exposed (Natriello, McDill, & Pallas, 1990; Rutter et al., 1979). Although the first two explanations have been explored in the large body of research on Head Start, the third is seldom invoked in discussions of Head Start "fade out." This paper provides empirical evidence relating to the explanation that focuses on Head Start participants' subsequent educational experiences.

Head Start is designed to serve economically disadvantaged children. Even among income-eligible children, however, it has been shown that Head Start actually serves the *most* economically and cognitively disadvantaged children, compared to eligible children who either attend other preschool programs for poor children or who do not attend preschool (Hebbler, 1985; Lee et al., 1988; Schnur et al., 1992). This is because one aim of Head Start is to serve the "poorest of the poor;" even today, Head Start participants are selected based on multiple criteria of disadvantage.[2]

What happens after Head Start? Research interest in evaluating the short- and long-term effectiveness of Head Start has been substantial, but considerably less attention has been directed to the quality of schooling these disadvantaged children receive once they "graduate" from the program. We know that even though Head Start generally benefits the children who participate, they still begin elementary school at a cognitive disadvantage, even compared to their economically disadvantaged peers (Hebbler, 1985; Lee et al., 1988). Because of their particular disadvantage in cognitive and economic terms, moreover, their subsequent school experiences are likely to take place in especially poor schools or in unchallenging programs within those schools (Spencer et al., 1985). This is documented by Orland (1990), who employed longitudinal data collected over multiple time points to demonstrate the increasing concentrations of poverty in schools as children move through elementary school. Poignant descriptions of the substantial differences in the quality of American schools attended by poor and affluent children are also provided by Kozol (1991).

We know that poor children are concentrated in schools of very low quality. We also know that differential school conditions influence children's learning potential. However, research on the sustained effects of Head Start has, by and large, assumed that the subsequent schooling of program participants is equivalent to that of their comparison-group peers who either did not attend preschool or attended other preschool programs.

Research Questions

This study investigates one aspect of the long-term effects of Head Start on the educational progress of young adolescents. Rather than examining its effects on cognitive, affective, or social competence outcomes, as almost all other studies on the topic have done, instead we focus on identifying the types of schools Head Start "graduates" attend as 8th graders. Using comparison groups defined by children's educational experience in the preschool years (either in Head Start, in non-Head Start preschools, or without preschool experience), we evaluate the quality of schools 8th graders attend as a function of the type of preschooling they experienced. Because Head Start is targeted at economically disadvantaged children, and because there is considerable variation in the educational experiences of poor children, the family background of these young people is taken into account.

Method

Sample and Data

The sample was drawn from the base year of the National Education Longitudinal Study of 1988 (NELS:88), a nationally representative and general-purpose study of the educational status and progress of about 25,000 8th graders in 1,035 American middle-grade schools,[3] sponsored by the National Center for Education Statistics (Ingels, et al., 1989). The NELS base-year study followed a nested or stratified data structure, whereby schools were first sampled, and then a fixed number of students was sampled within each school.[4] Data on students were collected from several sources: (1) a broad-based survey completed by the students; (2) achievement tests in mathematics, science, reading, and social studies; (3) a parent survey (usually completed by the mother -- Ingels, et al., 1990a); and (4) data from two of their teachers. Data describing schools were collected from principals (Ingels, et al., 1990b). Students and parents were also asked to describe their schools.

The study employs a subsample of NELS:88 data on students and schools, which we selected using several data filters: (1) only students with data from survey data from themselves, their parents, and their schools; (2)

only students with test score data; and (3) only students whose parents responded to two parent survey items concerning their children's preschool experience [excluding those who responded, "I don't know" to those items]. Appendix A provides details of preschool selection criteria. Although the first two data filters reduced the sample somewhat, the major "data loss" resulted from lack of preschool information from parents. Comparisons between the analytic sample for this study and the students excluded for this reason, displayed in Appendix B, show that the excluded group has very slightly higher family income, but slightly lower test scores and 2 percent more Hispanic students. We conclude that although the loss is numerically substantive, demographically it is trivial.

The resulting sub-sample is, thus, close to random sub-sample of 14,837 students in 975 schools (public and private), averaging 15.2 students per school. Of this sample, 14.2% attended Head Start (n=2,111), 42.1% did not attend preschool (n=6,240), and 43.7% attended preschools other than Head Start (n=6,486). Because the NELS design over-sampled certain types of schools and students (private schools and schools with high concentrations of minorites), the NELS student-level design weights are employed for all analyses. Results of this study are thus generalizable to the nation's 8th graders and their schools. This generalizability may not extend, however, to students of this age who attended Head Start.

Measures

Dependent measures. Rather than restricting our analysis to the definition commonly used to define school quality (i.e., in terms of academic achievement), we chose a very broad definition of the construct of "school quality" for the middle-grade schools attended by these young adolescents. Our logic here involved defining school quality in terms of both compositional resources (demographic, academic) and social environment (safety, relationships), and to employ both objective and perceptual measures to tap these constructs. We thus considered a wide array of questionnaire items from students, parents, and school principals which described schools. Once useful items were identified to tap the constructs we sought to define school quality, we used a three-step strategy in constructing our dependent measures: (1) we aggregated individual items from students and parents to the school level, and combined these with appropriate items reported by principals;[5] (2) we created substantively

meaningful and psychometrically solid composite measures at the school level using factor analytic techniques; (3) we merged these measures defining schools onto our sample of students in each school.

The six dependent measures of school quality define schools along the following dimensions: *social composition* (school average social class, or SES), *academic excellence* (average achievement, academic climate factor), *perceived safety* (unsafe school factor), *human relations* (positive teacher-student relations), and a *composite school quality factor*. The individual NELS-item components of each measure, their source, and their psychometric properties are specified in Appendix A. Each measure is normally distributed with high reliability.

Independent measures. Independent variables are of two types: students' preschool experience (Head Start [HS], no preschool [NPS], other preschool [OPS]) and a set of measures defining the demographic characteristics of students and their families. These include a needs ratio (constructed from family income and family size), parents' education, and race/ethnicity. The rationale behind the selection of these measures is specified below. As all independent variables were drawn from parent questionnaires, rather than from students, we assume that they are quite reliable. The source and definition of all variables is spelled out in Appendix A.

Analytic Model and Technique

We conceived this study as an analysis of covariance (ANCOVA), where we assess the effect of a "treatment" (preschool experience) on a set of outcome variables *net* of variables which might confound our findings. In this design, we follow the principles laid out by Anderson, et al. (1980). We confronted two important decisions in designing the analyses for this study. First was the selection of variables to control bias in results. Second was the selection of an appropriate analytic technique. The NELS data files are hierarchically stuctured, with students nested in schools. Because our independent variables define students, but dependent measures define schools, selecting the proper technique is not straightforward.

Which variables should be controlled? Our rationale in choosing controls was to *include* measures which might have been considered in entering preschool (especially criteria commonly used for selection into Head Start), but to *exclude* measures defining the academic progress of children between preschool and 8th grade. We looked for variables that had

been used in other studies of selection into preschool or Head Start (Hebbler, 1985; Lee, et al., 1988; Schnur, et al., 1992). Clearly, the major criterion is family income; but other studies and our conversations with local Head Start centers (see footnote 2) suggested that parental education, family size, and race/ethnicity were also considered. Thus, we chose to restrict our analytic models to controlling for these confounding variables. This logic also led us to not include measures of students' attitudes, behaviors, and achievement in Grade 8, despite the availability of such measures in the NELS database.[6]

An income proxy. We recognized the potential difficulty introduced by these controls having been measured in 1988 rather than a decade earlier, as these children began preschool. Although race and parents' education were probably stable over the period, longitudinal research on poverty status (e.g., Duncan, Smeedling, & Willard, 1992) suggests less stability over time in families moving in and out of poverty. This and other research also suggests, however, that during the 1980s there was more movement *out of* than *into* the middle class (Duncan et al., 1992; Newman, 1993), and that lower-middle class families often slipped into poverty. We concluded that it was therefore not likely that many of the families of Head Start children in this study moved from poverty to middle-class status during this period. Thus, we employed a measure of the family's economic well-being measured in 1988 as a proxy for their earlier economic condition. Mean group differences in family income and needs ratio (shown in Table 1) suggest that families of former Head Start students were still economically disadvantaged, compared to either comparison group, a decade after their children's eligibility for Head Start was determined.

Analytic method. The study's research questions suggest the use of ANCOVA. Although the NELS:88 data structure is ideal for evaluating the effects of schools on students (i.e., a search for school-level variables which predict student-level outcomes), unfortunately our research questions were not structured in this way. Rather, we sought to identify the characteristics of students (especially their preschool experience) which in part determined the quality of the schools they were attending (student-level variables predicting school-level outcomes). We identified other studies which posed research questions of the form, "Which types of students attend which types of schools?" (e.g., Chapter 7 of Bryk, Lee, & Holland, 1993; Lee & Marks, 1992). The authors of those studies employed regression

methods, where characteristics of schools (outcome variables) were merged with student-level characteristics (predictor variables). We followed that lead in employing that procedure in this study, i.e., we use ordinary least squares (OLS) regression under an ANCOVA framework.[7]

Our analytic models focus on the effects of two dummy variables which define preschool experience (Other Preschool vs. Head Start, No Preschool vs. Head Start) on each school quality measure, adjusting for the confounding variables defined above. We structured our analyses hierarchically, in that we examine the two Head Start contrasts unadjusted, and with successive adjustment for the demographic factors described above. The use of ANCOVA imposes a stringent requirement on this type of analysis, in that there may be no differential treatment effects for different levels of the covariates (i.e., ANCOVA allows no treatment-by-covariate interactions). We tested for such interactions in our analytic models, and found none. Thus, the use of ANCOVA is justified in this instance.

Results

Observed Preschool Group Differences

Background differences. Means and standard deviations on all variables used in this study are presented in Table 1. In addition to descriptions of the total sample of 8th graders (column 4), these statistics are presented separately for students with each type of preschool experience defined earlier. On virtually every measure considered, 8th graders who attended Head Start (column 1) are demographically disadvantaged, particularly compared to their OPS counterparts (column 2). Especially striking (but not surprising) are differences in the economic condition of the families of the children in these preschool groups (i.e., family income and the needs ratio). The family income of former Head Starters is less than half that of students who attended other preschools (a deficit of .75 SD),[8] and .43 SD below NPS students (column 3). Group mean differences in the needs ratio, which reflects income adjusted for family size, are quite comparable -- a Head Start deficit of .41 SD compared to children who did not attend preschool (NPS); .77 SD compared to those with OPS experience.

Racial/ethnic differences are also large. While over 41% of former Head Start students are Black (and 16% Hispanic), the racial composition of the two comparison groups is overwhelmingly White (88% for OPS, 81% for NPS).

Head Start attendees' parents also have less education than either OPS students (a difference of .84 SD) or NPS students (.22 SD below). Former Head Start attendees' families are also .31 SD larger than those of OPS students, but equivalent to the size of families in the NPS group.

Insert Table 1 about here

Outcome differences. The pattern for the school quality measures (lower section of Table 1) reflects group demographic differences, with 8th grade former Head Starters in middle-grade schools of considerably lower quality than those with OPS experience, and also generally below that of NPS students. These are summarized in the composite school factor, where former Head Starters' schools are .8 SD below those attended by 8th graders who attended other preschools, and .4 SD compared to schools attended by those without preschool experience (NPS). On individual school quality measures, the differences are particularly large for school SES and average achievement: on both measures, HS students' schools are rated over 1 SD below schools attended by OPS students and about .5 SD below those of NPS students. Also, former Head Start students attend middle-grade schools which they and their parents consider less safe and where the academic climate is weaker. One exception to this pattern is in teacher-student relations; such relations in schools attended by OPS students are considered by them to be somewhat less positive than schools attended by former HS students, although both groups' schools are rated lower than schools attended by NPS students on this measure.

The pattern presented by these group mean demographic differences -- where the least advantaged children had Head Start experience -- is no surprise, given the criteria for selection of these children as preschoolers into Head Start. Although the pattern of former Head Starters attending middle-grade schools of consistently lower quality is also unsurprising (since poor children are generally educated in schools of lower quality), it is nonetheless troubling. Our major purpose in presenting observed group means on dependent and independent variables is to lay the ground work for the multivariate analyses, to which we now turn.

Relationships Between Outcome Measures

As stated earlier, we aimed to examine a broad array of measures of school quality tapping different dimensions of this construct. As Table 2 suggests, however, the school quality measures are not completely independent. Especially strongly correlated are average achievement and school average SES (r = .793). Unsafe schools are those with weak academic climates, as indicated by the strong negative correlation between these measures (r = -.728). Average achievement is also strongly associated with academic climate (r = .506) and with unsafe school conditions (r = -.502). Teacher-student relations are less strongly related to other school quality measures, and the correlations suggest that a school's academic characteristics are negatively associated with positive teacher-student relations. Because of the relative non-independence of these measures of school quality, we created a factor-weighted composite school quality measure from these components, the description of which is detailed in Appendix A. We evaluate our multivariate model on this outcome, as well as each of the individual measures of school quality.

Insert Table 2 about here

Multivariate Regression Results

Model structure. We rely on ordinary least squares (OLS) regression, used in an ANCOVA evaluation framework, to determine whether there are unique residual relationships between preschool experience and the quality of schools subsequently attended. Given the substantial demographic differences between groups shown in Table 1, it is clear that these characteristics must be taken into account in any multivariate analyses. Tables 3-8 present separate hierarchical regression results for each school quality outcome, where the predictor set was identical for each. In the regression models, Head Start was coded as the comparison group for each dummy variable; thus, regression coefficients associated with these dummies represent the effects of each preschool group compared to Head Start (i.e., a positive effect for either preschool contrast translates to a negative effect for Head Start). Results are presented as standardized regression coefficients, to facilitate direct comparison across outcomes.

The results are presented as a series of hierarchical regression models, along with the proportion of variance (R^2) and the change in R^2 for each model. The first step (Model 1) evaluates the observed effects of the two Head Start contrasts. Model 2 estimates these constrasts with a statistical control for family economic condition (i.e., the needs ratio). Control for parents' education is added in Model 3. The full regression model -- Model 4 -- adds additional contol for the two race/ethnicity measures. The major purpose of structuring our analyses in this way is to allow examination of the *change* in the Head Start contrast effects with the introduction of each subsequent statistical control. We did not construct these analyses with the aim of maximizing the explanatory power of models to determine school quality. Rather, our major purpose is to evaluate the unique effect of children's preschool experience, after taking family demography into account.

Average School SES. Table 3 displays regression results for school SES. After taking family demographics into account (which exert very strong effects), both comparison group coefficients are still positive and significant below the .001 probability level for every model. Without adjustment, NPS students are in schools with average SES .181 units above that of former Head Start students. This effect declines to .046 when demographic controls are included. The Head Start contrast is yet more striking compared to OPS students, whose schools are .503 units higher on average school SES, and .186 after all controls are introduced. Unsurprisingly, all demographic factors in the model are strongly and significantly related to average school SES below the .001 probability level, with relationships especially strong for the needs ratio and parents' education (themselves SES measures). The final model explains 36.6% of the variance in average school SES, and each added control significantly added to the model's explanatory power.

Insert Tables 3 and 4 about here

Average achievement. Regression results for this outcome (in Table 4) show patterns very similar to those for average school SES; again, all coefficients are significant below the .001 level of probability at every stage of the hierarchical model. Thus, students without preschool experience attend middle-grade schools typified by considerably higher average

achievement than those former Head Start students attend. Before adjustment this effect was .260 units; after adjustment, the effect was .078. Head Start contrasts were more marked compared to students who attended other preschools -- .484 units before adjustment, .162 including demographic controls. Again, while our purpose was not to explain maximal variance, the proportion of variance in average achievement explained by the final model is substantial (29.6%), and each model change is also highly significant.

Unsafe school factor. Unlike dependent measures where a higher value on the variable suggests a higher-quality school, the unsafe school factor is coded so that more *unsafe* schools are rated higher. Thus, results again indicate that former Head Start students are disadvantaged in terms of the safety of their current schools compared to 8th graders in both preschool groups (Table 5), since the contrasts have significant and negative coefficients compared to Head Start. As before, differences with the OPS group are larger than those with the NPS group, although both contrasts are statistically significant (HS vs. NPS, below .01, HS vs. OPS below .001). The Head Start/no preschool contrast was -.176 units before adjustment, -.035 after. Compared to Head Start students, students who attended other preschools were likely to attend safer schools (an unadjusted effect of -.269 units, -.060 after adjustment). Students' family needs ratio, parents' education, and race/ethnicity are also strongly associated with attending unsafe schools. Black students are especially likely to attend such schools. The unsafe school factor is less well explained by the model (R^2 of 10.8%) than the two previous outcomes, although the results are still statistically significant below the .001 probability level, with each model change also significant.

Insert Tables 5 and 6 about here

Positive teacher-student relations. Table 6 displays hierarchical regression results for this outcome, indicating that the final model explains variance in teacher-student relations quite poorly (R^2 of only 1.7%). Before and after statistical adjustment, when compared to students who did not attend preschool (NPS), students with Head Start experience attend schools which evidence significantly poorer relations between teachers and students (.046 units before adjustment [$p \leq .001$] amd .028 after adjustment [$p \leq .05$). There is no significant difference between HS

and OPS students on this outcome. Relations between teachers and students are described significantly less positively in schools attended by minority students, especially Hispanics. Curiously, students with fewer financial resources (needs ratio) and less educated parents rate social relations in their schools more positively than their peers with more educated parents.

School academic climate. The academic climate of schools attended by students who attended other preschools is significantly better than those where former Head Start students are enrolled (an effect of .246 units before adjustment, .076 including adjustment). There are no differences between the HS and NPS groups (see Table 7). Other demographic factors (needs ratio, parental education, race/ethnicity) show strong associations with academic climate. A modest but significant proportion of variance in this outcome is explained by the final model (R^2 of 9.9%), and each model change was also highly significant.

Insert Tables 7 and 8 about here

Composite school quality factor. The pattern of former Head Start students attending schools of lower quality than either comparison group is summarized by the results for the school quality composite index, which are shown in Table 8. Again, the magnitude of the two Head Start contrasts decreases with subsequent statistical adjustments. Both contrasts remain statistically significant below the .001 probability level, however, even in the full model (Model 4). After taking family economic condition, parents' education, and children's race and ethnicity into account, 8th graders who attended Head Start attend schools of lower quality than their counterparts who did not attend preschool (an effect compared to NPS of .04) and particularly in comparison to those 8th graders who had a preschool experience other than Head Start (a contrast with OPS of .135). Model 4 explains a quarter (24.2%) of the variance for the school quality composite.

Summary of regression results. A summary of results of the residual preschool contrasts (Model 4) from Tables 3-8 is presented in Table 9 and Figure 1. To facilitate comparison across the outcomes, and to discuss the results in a meaningful metric, coefficients representing the Head Start group were reversed and recomputed in effect size (SD) units,[9] with Head Start contrasted with the NPS group (column 1) and the OPS group (column

2). Significance levels are taken from Tables 3-8. Negative effects indicate that 8th graders who attended Head Start scored lower than the two preschool contrast groups. Because the coding of the unsafe school factor is opposite from the other dependent measures, Head Start effects here are positive (i.e., these students are in more unsafe schools).

Insert Table 9 and Figure 1 about here

Table 9 shows that compared to students who attended other preschools, former Head Starters are in schools of considerably lower SES, lower average achievement, and of lower overall quality; these effects are of medium magnitude (close to .4 SD for the first two outcomes, close to .3 SD for the composite). Moreover, Head Start students attend less safe schools and schools with lower academic climate than OPS students; while small in magnitude (.1-.2 SD), the probability of obtaining these effects by chance is nevertheless very low. Small but highly significant differences favor former NPS students over former Head Start attendees in terms of the average SES, average achievement, and overall quality of the schools they attend as 8th graders. We conclude that on 5 out of 6 measures of school quality considered here, even taking substantial demographic group differences into account, students who attended Head Start as preschoolers possess a residual disadvantage in comparison with their peers who did not attend preschool, and are particularly disadvantaged compared to those who attended non-Head Start preschools.

The summary results from Table 9 are displayed in Figure 1, where effect sizes are also presented in SD units. It is clear from this graph that, over the several dimensions with which we defined school quality, former Head Start students are particularly disadvantaged in comparison to their counterparts with other preschool experience (the gray bars), although the comparion of students with Head Start experience to those who did not attend preschool (the black bars) also shows former Head Starters at a residual disadvantage. Recall that these effects are computed *net* of the demographic characteristics of these students and their families.

Discussion

Implications of These Findings

Poverty and school quality. We draw several implications from these results. The first, while unsurprising, is nevertheless troubling in terms of the equality of educational opportunity afforded to the nation's children. Due primarily to the local funding and residential basis for school attendance in the United States, our most disadvantaged children must attend our lowest quality schools -- where learning levels are lower and the climate is not academically stimulating, where poverty is concentrated; in schools which are unsafe, and which are characterized by less harmonious relations between staff and students. These findings lead to the conclusion that American children who need the best educational environments to lift them from poverty are actually enrolled in our nation's lowest quality schools. Here, "quality" is defined not only in terms of accumulated learning, but also by several rather basic environmental factors associated with educational progress.

Why do Head Start effects fade out? The second implication concerns the long-term efficacy of Head Start participation for children living in poverty. Our results suggest one important substantive explanation for many other studies' conclusions that many of the effects of preschool intervention for poor children fade out over time (especially the cognitive effects). Even with the reasonably well established research conclusion -- that poor children accrue substantial immediate cognitive and social competence benefits from participation in Head Start -- this study finds that Head Start "alumni/ae" attend systematically inferior schools thereafter, *over and above* the disadvantages which accrue from their likelihood of special social disadvantage (minority status, low family income, less parental education, and the like). No matter how strong the early "boost" received by these children from their Head Start experience, the fact that their subsequent education is in lower quality schools (and that that learning is likely to be inferior in those schools) would seem to undermine any early advantage.

What might explain why young adolescents with preschool experience in Head Start end up in even more inferior schools than their social background characteristics would predict? A possible explanation relates to the types of children who actually experience Head Start. Several studies

have demonstrated that Head Start programs more than two decades ago enrolled children who were especially cognitively and socially disadvantaged, even in comparison to income-eligible children who attended other preschools or did not attend preschool at all (Hebbler, 1985; Lee et al., 1988; Schnur et al., 1992). This situation suggests that persons responsible for implementing social programs are anxious to serve the "most deserving" applicants, particularly when program availability is limited. From a social service perspective, the aim of selecting children with the greatest need for the program is reasonable, even noble. That the Head Start policy of seeking out the *most* disadvantaged children continues to this day was confirmed by administrators of several Head Start centers in our local area, although these people suggested no special cognitive criteria.[10]

Social Policy Issues

The purpose of this study was not to evaluate the long-term effects of Head Start, and thus is not a policy study *per se*. Nevertheless, these findings (and the educational conclusions we draw from them) have some implications for social policy. The findings concerning the strong association between children's social disadvantage and the quality of the schools they attend (in effect, a *de facto* segregation of schools by family economic condition) suggest that our nation's policies which allow disadvantaged children to be concentrated in low-quality schools actually promote an increase in socially-induced learning differentials as children advance through the educational system. While the rhetoric of conventional wisdom invokes education as a major *solution* for many of the problems accruing to children growing up in poverty, the facts suggests that stratification in school quality by social condition -- a practice our nation allows through the sanctity of local control -- may in fact be part of the *problem*.

Our conclusions concerning the residual disadvantage of young adolescents who attended Head Start, in terms of the quality of the middle-grade schools they attend, also have serious implications for social policy. Although the nation is poised to invest even more in poor young children, by virtue of its support for expanding preschool programs like Head Start, how to affect these children's deficient educational progress thereafter receives less scrutiny. These findings suggest that either deliberate

federal, state, and local policies concerning the education of disadvantaged children or, perhaps, a lack of attention to the results of allowing poverty to be concentrated by geographic area, systematically undo with one hand something to which we devote substantial resources with the other.

The results also suggest a potential political reality. Perhaps it is the case that our nation is only willing to offer a helping hand to poor children at the very beginning of their formal education, with the expectation that this relatively inexpensive "boost" would be sufficient, and that a more sustained (and certainly more expensive) commitment to the education of poor children is politically unpalatable. The underfunding of more substantial compensatory educational efforts, such as Project Follow Through, offers support to the existence of this reality (Kennedy, 1978; Zigler & Muenchow, 1992). This would suggest that, at least for some, the provision of a quality education is not a political "right," but rather a privilege afforded to those children and their families who can afford to seek it out -- even in the public sector.

We find some cause for at least a bit of optimism in one current federal educational policy. In its proposal for reauthorization of the Elementary and Secondary Education Act, the Clinton administration has called for a shift in the targeting of Chapter 1, the federal government's "flagship program" for funding compensatory education (Miller, 1993). The Administration's proposal seeks to shift the impact of Chapter 1 away from eligible *individuals* and toward the *schools* they attend, with the hope of improving the entire environment of schools which enroll large numbers of poor children. Although this proposal seems to take for granted that poor children will be concentrated in poor schools, the proposed change seems at least to recognize the appropriateness of targeting more federal dollars to schools which enroll mostly poor children (i.e., more resources would be devoted to schools which need them the most). The results of this study would seem to support the idea behind the federal policy change in Chapter I as one avenue for improving the education of poor children. Reviving or expanding the Follow Through model would be another.

We are anxious that our words which challenge some basic notions upon which our nation's social policies concerning the education of children in poverty rest not be construed as a lack of support for Head Start. We firmly believe that Head Start is a worthwhile program, and our earlier studies have confirmed its efficacy. However, we question a public policy

which directs resources at the entry point of schooling while simultaneously allowing serious structural inequalities to obviate these early effects, however beneficial they may be. We reiterate here an idea stated elsewhere: "Inducing sustained and successful academic experiences for children of poverty *throughout* their educational careers, rather than focusing on efforts to "fix" the problem with one-year preschool programs (however successful they may be), is absolutely essential" (Lee et al., 1990).

Technical Notes

1. While there is general agreement about the fading effects of Head Start in the cognitive and affective domains, social gains (e.g., graduating from high school, staying out of prison) have been more enduring (Natriello, McDill, & Pallas, 1990; Schweinhart & Weikart, 1986). While there is some dispute about whether such "outcomes" are appropriate measures upon which Head Start should be evaluated, nevertheless such long-term social gains have been used frequently to "sell" Head Start.

2. We spoke with Head Start centers in a large urban area, in a mixed suburban area, and in a rural area in our state in Spring 1993. Administrators of all three centers confirmed that multiple criteria were considered in selecting participants from the applicant pool, in addition to the most important criterion for eligibility: family income below the federal poverty guidelines.

3. We use the term "middle-grade schools" here, since the NELS:88 study included any type of school attended by 8th graders. Only about half of these schools were middle schools or junior high schools (including grades 6-9), while about one-fifth were elementary schools (including grades K-8), and one-sixth included high school. Almost every conceivable grade span was captured in this sample (Ingels, et al., 1990b).

4. The two-stage sampling plan for NELS involved oversampling of two types of schools -- private schools and schools with high minority enrollments. Although the NELS design weights (which we employed in all our analyses) allow analytic results from these data to be generalized to the 1988 American 8th grade school population, the oversampling was meant to provide stable estimates for certain subgroups. In the case of this study, this oversampling was particularly useful, as it provided a considerable number of minority students (and the low-income schools they attend).

5. In order to accurately capture the characteristics of the schools attended by these children, we note that the aggregation of student and parent variables used to define schools included the *entire* NEL:88 sample, and not just the sample for this study.

6. Although NELS:88 includes measures of 8th graders' achievement in four curricular areas, we considered these as more likely to serve as accumulated measures which probably reflected the quality of schools attended during the intervening period (i.e., between preschool and 8th grade) more than cognitive status prior to preschool entry. In selecting confounding variables, two considerations are important: (a) to control bias which might have influenced selection into the "treatment" at the outset, and (b) *not* to include measures which would inappropriately explain away the treatment effect (Anderson et al., 1980). We considered 8th grade achievement to fall into the latter category. We rejected the inclusion of other measures of individual students' academic behaviors and attitudes as control variables for the same reason.

7. An alternative strategy we considered (also suggested by Anderson et al., 1980) is the use of matched-sample comparison groups. The appeal

of matching is twofold: (1) comparisons are between racially and socially equivalent groups to former Head Start attendees, and (2) analysis is more straightforward (i.e., simple t-tests between group differences). We actually constructed such matched-sample comparison groups with NELS data, matching OPS and NPS groups to the HS sample by race/ethnicity and SES quartiles. Although the matching was successful for such nominal variables as race, quartile matching for SES resulted in small residual (but statistically significant) group differences on family income and parents' education. Since the comparison groups constructed this way were relatively small (especially for the OPS group), statistical power correspondingly weakened due to an increase in the Type II error rate. Thus, we reluctantly abandoned matching in favor of the ANCOVA strategy described herein.

8. We follow the lead of Rosenthal and Rosnow (1984, p.360), who describe a substantive interpretation of effect size magnitudes measured in SD units: effects of .2 and below are "small"; effects between .2 and .5 are "medium," and those over .5 are "large." These criteria were also used by the Head Start Synthesis Project (McKey et al., 1985) and by Lee et al., (1988, 1990).

9. This computation involved (a) dividing the appropriate unstandardized regression coefficients from the final models in Tables 3-8 by the SD of the comparison group -- OPS or NPS -- on each measure (from Table 1), and (b) changing the sign from the standardized regression coefficients from Tables 3-8. This method of computing effect sizes is advocated by Rosenthal and Rosnow (1984), and is used in several other studies which focus on Head Start (e.g., Lee et al., 1988, 1990; McKey et al., 1985).

10. This explanation hints that former Head Start students' special proclivity to attend low-quality schools might not be sustained if we were able to include in our model a measure of students' cognitive status *before they began preschool*. Unfortunately, since no such measure is available in the NELS data file, we may not test this hypothesis. However, controlling for social background (which our model assumes to have remained relative constant between preschool and 8th grade) should account for the the special social disadvantage of Head Start students. The appropriateness of introducing an ability control into our analytic model, even from a theoretical stance, is questionable in our opinion. Children are not "selected" into American public schools on this criterion.

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Table 1: **Means and Standard Deviations of Model Variables for 8th Graders Who Attended Head Start, Other Preschool Programs, and No Preschool**

	Head Start	Other Preschool	No Preschool	Total Sample
Sample Size(a)	2,111	6,240	6,486	14,837
Independent Variables:				
o Family Income($)(b)	22,461 (23,170)	53,153 (40,712)	33,018 (24,589)	39,689 (34,504)
o Family Size	4.73 (1.55)	4.36 (1.18)	4.72 (1.44)	4.61 (1.42)
o Needs Ratio(c)	1.90 (1.97)	4.64 (3.55)	2.77 (2.14)	3.39 (2.97)
o Parents' Education(Yrs)	13.01 (2.06)	15.32 (2.74)	13.50 (2.25)	14.14 (2.63)
o Race/Ethnicity (Proportions)				
Black	.413	.072	.084	.126
Hispanic	.162	.051	.105	.097
White	.425	.877	.811	.777
Dependent Variables:				
o School Average SES	-.364 (.386)	.091 (.436)	-.202 (.373)	-.115 (.439)
o Average Achievement	47.32 (4.80)	52.19 (4.59)	49.88 (4.46)	50.31 (4.87)
o Unsafe School Factor	.965 (.879)	.462 (.898)	.645 (.883)	.627 (.904)
o Tchr-Stdnt Relations Fac.	.359 (.661)	.318 (.741)	.419 (.722)	.364 (.723)
o School Academic Climate Factor	-.717 (.656)	-.326 (.821)	-.587 (.718)	-.510 (.766)
o Composite Schl Quality Factor	-.544 (.714)	.171 (.853)	-.238 (.744)	-.116 (.821)

a. Samples sizes are presented unweighted. Means and standard deviations are computed using the NELS:88 student design weights.
b. Standard deviations (SD) are in parentheses under their respective means. As race/ethnicity is a categorical variable, SD's are ommitted.
c. The needs ratio is computed as family income divided by the adjusted poverty threshold for 1988 (U.S. Census, 1992:461).

Table 2: **Zero-order Correlations Between Individual School Quality Measures** (a)

	Average Achievement	Unsafe School Factor	Tchr-Student Relations Fac.	School Academic Climate Factor
School Average SES	.793	-.407	-.114	.490
Average Achievement		-.502	-.172	.506
Unsafe School Factor			.356	-.728
Teacher-Student Relations Factor				-.438

a. Although these are measures of schools, correlations were computed at the student level. This is because analyses were conducted at that level.

Table 3: **Results of OLS Regressions of Head Start Effects on Quality of School Attended at 8th Grade: Average School SES**

Standardized Regression Coefficient

	Model 1	Model 2	Model 3	Model 4
No Preschool (v. HS)	.181***	.124***	.114***	.046***
Other Preschool(v.HS)	.503***	.326***	.255***	.186***
Needs Ratio		.391***	.273***	.255***
Parents' Education			.288***	.270***
Black				-.122***
Hispanic				-.127***
Proportion of Variance Explained (R^2)	.150***	.283***	.343***	.366***
Change in R^2		.133***	.059***	.023***

*** $p \leq .001$

Table 4: **Results of OLS Regressions of Head Start Effects on Quality of School Attended at 8th Grade: Average Achievement**

	Standardized Regression Coefficient			
	Model 1	Model 2	Model 3	Model 4
No Preschool (v. HS)	.260***	.217***	.209***	.078***
Other Preschool(v.HS)	.484***	.350***	.292***	.162***
Needs Ratio		.295***	.199***	.168***
Parents' Education			.235***	.209***
Black				-.246***
Hispanic				-.169***
Proportion of Variance Explained (R^2)	.114***	.191***	.230***	.296***
Change in R^2		.076***	.040***	.066***

*** $p \leq .001$

Table 5: **Results of OLS Regressions of Head Start Effects on Quality of School Attended at 8th Grade: Unsafe School Factor**

	Standardized Regression Coefficient			
	Model 1	Model 2	Model 3	Model 4
No Preschool (v. HS)	-.176***	-.153***	-.149***	-.035**
Other Preschool(v.HS)	-.269***	-.198***	-.170***	-.060***
Needs Ratio		-.158***	-.111***	-.088***
Parents' Education			-.114***	-.098***
Black				.223***
Hispanic				.089***
Proportion of Variance Explained (R^2)	.033***	.054***	.064***	.108***
Change in R^2		.022***	.009***	.044***

** $p \leq .01$; *** $p \leq .001$

Table 6: **Results of OLS Regressions of Head Start Effects on Quality of School Attended at 8th Grade: Teacher Student Relations**

Standardized Regression Coefficient

	Model 1	Model 2	Model 3	Model 4
No Preschool (v. HS)	.046***	.056***	.057***	.028*
Other Preschool(v.HS)	-.020	.008	.020	-.011
Needs Ratio		-.065***	-.045***	-.054***
Parents' Education			-.047***	-.059***
Black				-.047***
Hispanic				-.088***
Proportion of Variance Explained (R^2)	.004***	.008***	.009***	.017***
Change in R^2		.004***	.002***	.008***

* $p \leq .05$; *** $p \leq .001$

Table 7: **Results of OLS Regressions of Head Start Effects on Quality of School Attended at 8th Grade: Academic Climate Factor**

Standardized Regression Coefficient

	Model 1	Model 2	Model 3	Model 4
No Preschool (v. HS)	.081***	.049***	.044**	.009
Other Preschool(v.HS)	.246***	.145***	.110***	.076***
Needs Ratio		.221***	.162***	.154***
Parents' Education			.144***	.138***
Black				-.067***
Hispanic				-.037***
Proportion of Variance Explained (R^2)	.037***	.080***	.095***	.099***
Change in R^2		.043***	.015***	.004***

** $p \leq .01$; *** $p \leq .001$

Table 8: **Results of OLS Regressions of Head Start Effects on Quality of School Attended at 8th Grade: Composite School Quality Factor**

	Standardized Regression Coefficient			
	Model 1	Model 2	Model 3	Model 4
No Preschool (v. HS)	.181***	.137***	.129***	.040***
Other Preschool(v.HS)	.417***	.278***	.222***	.135***
Needs Ratio		.307***	.214***	.193***
Parents' Education			.226***	.209***
Black				-.098***
Hispanic				-.171***
Proportion of Variance Explained (R^2)	.094***	.176***	.212***	.242***
Change in R^2		.082***	.036***	.029***

** $p \leq .01$; *** $p \leq .001$

Table 9: **Summary of Effect Sizes of Adjusted Head Start Effects on Quality of 8th Grader's School**

Outcome Variable	Head Start vs. No Preschool	Head Start vs. Other Preschool
o School Average SES	-.11***(a)	-.38***
o Average Achievement	-.17***	-.35***
o Unsafe School Factor	.07*	.12***
o Positive Teacher-Student Relations	-.06*	.02
o School Academic Climate	-.02	-.14***
o Composite School Quality Factor	-.08***	-.28***

* $p < .05$; *** $p < .001$

a. Effect size computed by dividing the unstandardized regression coefficient for each outcome variable (from Tables 3-7) by the standard deviation of the comparison group for that variable.

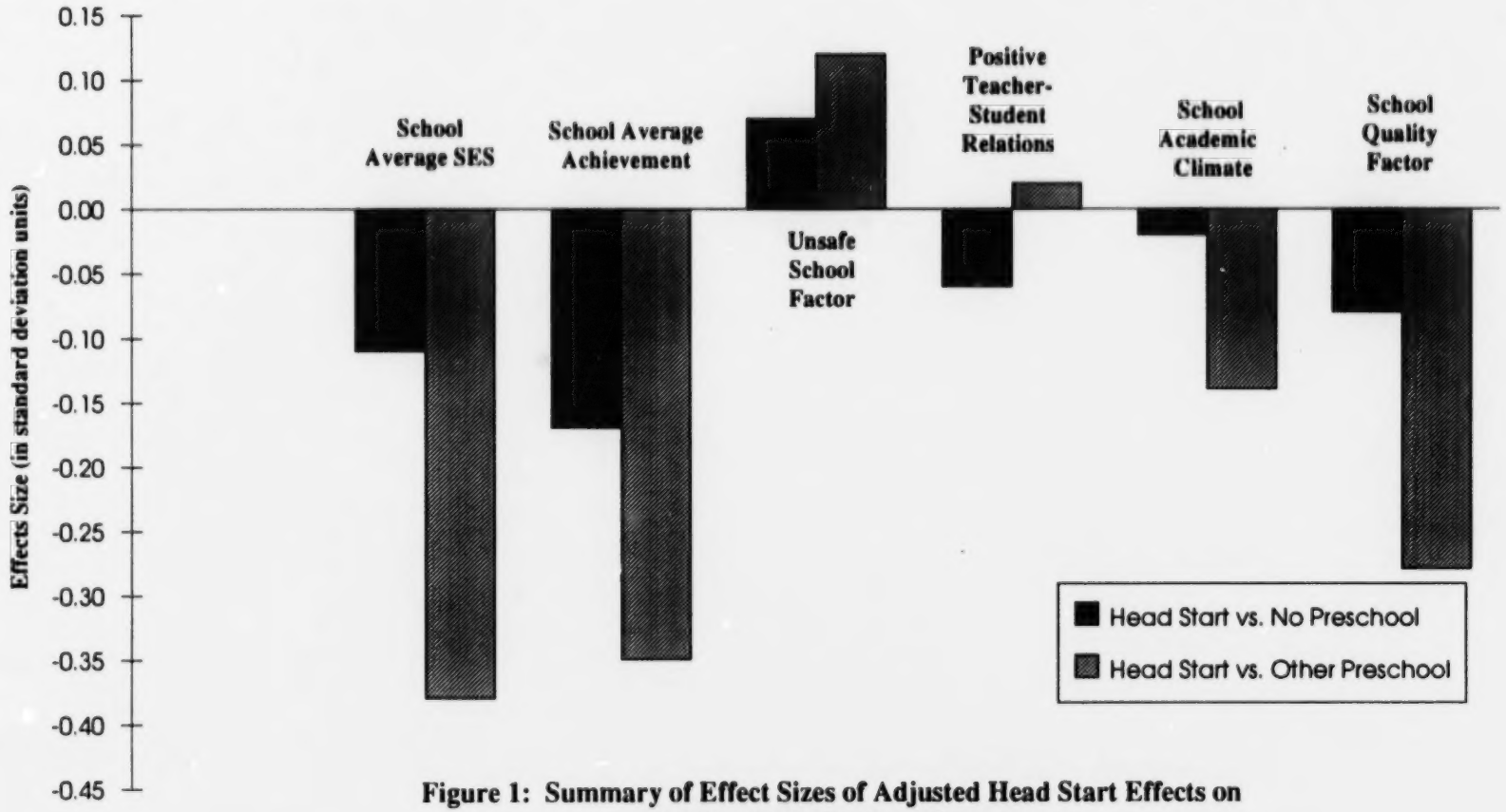

Figure 1: Summary of Effect Sizes of Adjusted Head Start Effects on Quality of 8th Graders' Schools

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Appendix A: Details of Variable Construction

Independent Variables:

Preschool Experience. A three-level categorical variable was created from parents' reports of whether or not 8th graders attended Head Start (BYP38C) or any preschool or nursery school (BYP38B). Students whose parents responded "yes" to BYP38C were coded as Head Start students, remaining students whose parents responded "yes" to BYP38B were coded as attending Other Preschools. Students whose parents responded "no" to BYP38B or BYP38C were coded in the No Preschool group. Students whose parents answered BYP38B with "I don't know" or who didn't respond to either item were dropped from the analysis, resulting in a loss of 9,166 students (38.2% of the sample). In regressions, two dummy variables were created, with Head Start as the base group: No-Preschool (vs. Head Start) and Other Preschool (vs. Head Start).

Family Income. Taken from parents' reports of total family income in 1987 (BYP80). Categories were recoded into dollar amounts.

Family Size. From parents' report, the total number of parents and siblings. Used the NELS variable, BYFAMSIZ. Close to normally distributed, with slight positive skew.

Needs Ratio. Computed by dividing family income by the 1988 figure for the adjusted poverty threshold (using the CPI) for each family size. For each family size, these figures are: one person: $5,534; two persons: $7,077; 3 persons: $8,667; four persons: $11,108; five persons: $13,141; six persons: $14,834; seven persons: $16,763; eight persons: $18,628; nine or more persons: $22,169 (Congressional Budget Office, 1988). The metric represents the multiple of the poverty threshold represented by each family's income, with higher numbers representing higher adjusted income. A value of 1.00 suggests family income at the poverty threshold, values over 1 above the poverty threshold, and less than 1 below the poverty threshold.

Parents' Education. From parents' reports (BYPARED), the parent's highest year of education, recoded into total years of education (i.e., high school graduation=12, college graduation =16). Close to normally distributed, with slight positive skew.

Race/Etnicity. Taken from parents' report (RACE). All students whose race/ethnicity was not reported as Black or Hispanic were coded in the White category. In regressions, dummy variables for Black (Black=1, else=0) and Hispanic (Hispanic=1, else=0) were used, with Whites as the comparison group.

Dependent Variables:

Several steps were involved in creating the dependent variables. First, variables describing school quality were created on the entire NELS student sample (i.e., the students missing preschool information were *not* dropped from the aggregations), including student and parent reports about the school, and were standardized on that sample. Second, these variables were aggregated to the school level. Third, these aggregates were combined

with measures from principals into composites. Last, the school-level aggregates were appended back to the student file, so that each student record contained descriptive information on the school he or she attended in the 8th grade, created from a random sample of students in the school. These latter variables were used as dependent variables in regression analyses. The following describes the components and psychometric characteristics of each composite we created.

School Average SES. School-level aggregate of social class z-score composite created from parents' reports (BYSES). The social class measure includes family income, parents' education, parents' occupational prestige, and a composite of education-related possessions in the home. Normally distributed variable.

Average Achievement. School-level aggregate of four student achievement tests (mathematics, science, reading, social studies). On the entire NELS student file, composite test score is standardized to mean=50, SD=10. Normally distributed variable.

Unsafe School Factor. This composite variable is normally distributed with high reliability (Cronbach alpha = .82). It was created with principal components factor analysis, using varimax rotation. Its 7 components include 3 measures of students' reports of the seriousness of certain problems in their schools: physical conflicts among students (BYS58D), student possession of weapons (BYS58J), and physical abuse of teachers (BYS58J); and a positive reponse to students' statement, "I don't feel safe in this school (BYS59K). It includes parents' response (reversed) to the statement, "My child's school is a safe place" (BYP74I), and 2 items taken from principals' descriptions of problems in their schools: possessions of weapons (BYSC49I) and physical abuse of teachers (BYSC49J).

Teacher-Student Relations Factor. This composite variable is normally distributed with high reliability (Cronbach alpha = .90). Created with principal components factor analysis, using varimax rotation. Includes students' positive responses to 6 items: "Students get along well with teachers" (BYS59A), "The teaching in this school is good" (BYS59F), "Teachers are interested in students" (BYS59G), "Teachers praise my efforts" (BYSS59H), "In class I feel put down by teachers" (reversed) (BYS59I), and "Most of my teachers listen to what I say" (BYS59J).

School Academic Climate Factor. This composite variable is normally distributed with high reliability (Cronbach alpha = .90). It was created with principal components factor analysis, using varimax rotation. Its 12 components come from 3 sources: (a) students' reports of seriousness of certain problems in their schools (student tardiness -- BYS58A; student absenteeism -- BYS58B; students cutting classes BYS58C); (b) the principal's report on the seriousness of the same problems in the school (BYSC49A, BYSC49B, BYSC49C); and parents' responses to the following statements: "The school places a high priority on learning" (BYP74A), "Homework assigned is worthwhile" (BYP74B), "My child is challenged in school" (BYP74C), "The school is preparing students well for high school" (BYP74G), and "The school is preparing students well for college" (BYP74H).

Composite School Quality Factor. This measure was formed from the five school quality measures described above, by means of principal components factor analysis, using the varimax rotation procedure. Factor loadings were as follows:

School Academic Climate	.881
Average Achievement	.840
Unsafe School Factor	-.824
School Average SES	.806
Teacher-Student Relations	-.601

Variable has strong psychometric properties: an eigenvalue of 3.17 and a reliability of .851, as measured by Cronbach's alpha. Variable is normally distributed as a z-score (mean = 0, SD = 1) on the entire NELS file.

Appendix B: **Means for Model Variables for Included and Excluded Cases** (a,b)

	Included Cases (n=14,837)	Excluded Cases (n=6,838)
Independent Variables:		
Family Income($)	$43,791	$44,418***
Family Size	4.59	4.71
Needs ratio	2.47	2.55
Parents' Education (Yrs)	14.41	14.36
Race/Ethnicity (Proportions)		
Black	0.12	0.12
Hispanic	0.12	0.14***
Dependent Variables:		
School Average SES	-0.04**	-0.06
Average Achievement	50.99	50.55***
Unsafe School Factor	0.54	0.57
Teacher-Student Relations Factor	0.27	0.25
School Academic Climate Factor	-0.37*	-0.40

* $p \leq .05$; ** $p \leq .01$; *** $p \leq .001$

a. Virtually all the NELS respondents that were excluded from this study were those whose parents had either: (a) not responded to the NELS item BYP38 describing the child's preschool experience, or (b) had responded "I don't know" to that item.

b. Mean differences tested with t-tests.